

In The Claims:

Please amend the claims in the below-indicated manner:

Please cancel claims 1-42, without prejudice or disclaimer

Please add the following new claims:

A<sup>2</sup>

Sub B43.

(Added) A semiconductor device containing at least one air gap made in accordance with a method comprising the steps of:

(A) forming a patterned layer of sacrificial material on a substrate corresponding to a pattern of one or more gaps to be formed in the semiconductor structure;

(B) depositing a second material on the substrate within regions bordered by the sacrificial material with the second material being formed with a height less than the height of the adjacent sacrificial material;

(C) forming an overcoat layer of material overlying the patterned layer of sacrificial material and second material in the regions bordered by the sacrificial material;

(D) causing the sacrificial material to decompose into one or more gaseous decomposition products; and

(E) removing at least one of the one or more gaseous decomposition products by passage through the overcoat layer so that one or more air gaps are formed within the semiconductor structure,

whereby the height of the one or more air gaps exceeds the height of the one or more areas of second material.

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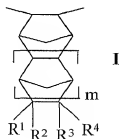
44. (Added) The semiconductor device as set forth in claim 43, wherein step (B) includes using a conductive material to form conductive leads on opposite sides of portions of the sacrificial material.

45. (Added) The semiconductor device as set forth in claim 43, wherein the sacrificial material is a cyclic olefin.

46. (Added) The semiconductor device as set forth in claim 45, wherein the cyclic olefin is a dicyclic olefin.

47. (Added) The semiconductor device as set forth in claim 43, wherein the sacrificial material is a norbornene-type polymer.

48. (Added) The semiconductor device as set forth in claim 47, wherein the norbornene-type polymer comprises repeat units of the general formula:



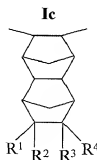
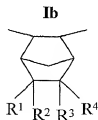
wherein R<sup>1</sup> and R<sup>4</sup> independently represent hydrogen or linear or branched (C<sub>1</sub> to C<sub>20</sub>) alkyl; R<sup>2</sup> and R<sup>3</sup> independently represent hydrogen, linear or branched (C<sub>1</sub> to C<sub>20</sub>) alkyl or the groups:



*2*  
*Conf.*

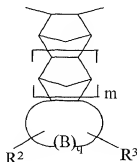
$R^9$  independently is hydrogen, methyl, or ethyl;  $R^{10}$ ,  $R^{11}$ , and  $R^{12}$  independently represent linear or branched ( $C_1$  to  $C_{20}$ ) alkyl, linear or branched ( $C_1$  to  $C_{20}$ ) alkoxy, linear or branched ( $C_1$  to  $C_{20}$ ) alkyl carbonyloxy, and substituted or unsubstituted ( $C_6$  to  $C_{20}$ ) aryloxy;  $m$  is a number from 0 to 4; and  $n$  is a number from 0 to 5; and at least one of substituents  $R^2$  and  $R^3$  is selected from the silyl group represented by the formula set forth under **1a**.

49. (Added) The semiconductor device as set forth in claim 48, wherein in Formula **I** above,  $m$  is preferably 0 or 1 as represented by structures **1b** and **1c**, respectively:



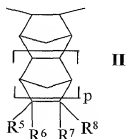
wherein  $R^1$  to  $R^4$  are as previously defined and at least one of  $R^2$  and  $R^3$  is a silyl substituent represented by **1a**.

50. (Added) The semiconductor device as set forth in claim 48, wherein  $R^1$  and  $R^4$  taken together with the two ring carbon atoms to which they are attached comprise a repeat unit of the following structure:



wherein B is a methylene group, q is a number from 2 to 6, and R<sup>2</sup> and R<sup>3</sup> are as defined above.

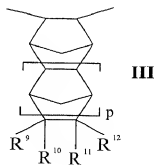
51. (Added) The semiconductor device as set forth in claim 48, wherein the norbornene-type polymer further comprises hydrocarbyl substituted polycyclic repeating units selected from units represented by Formula II below:



wherein R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> independently represent hydrogen, linear and branched (C<sub>1</sub> to C<sub>20</sub>) alkyl, hydrocarbyl substituted and unsubstituted (C<sub>5</sub> to C<sub>12</sub>) cycloalkyl, hydrocarbyl substituted and unsubstituted (C<sub>9</sub> to C<sub>40</sub>) aryl, hydrocarbyl substituted and unsubstituted (C<sub>7</sub> to C<sub>16</sub>) aralkyl, (C<sub>3</sub> to C<sub>20</sub>) alkynyl, linear and branched (C<sub>3</sub> to C<sub>20</sub>) alkenyl, or vinyl; any of R<sup>5</sup> and R<sup>6</sup> or R<sup>7</sup> and R<sup>8</sup> can be taken together to form a (C<sub>1</sub> to C<sub>10</sub>) alkylidenyl group, R<sup>5</sup> and R<sup>6</sup> when taken with the two ring carbon atoms to which they are attached can represent saturated and unsaturated cyclic groups containing 4

to 12 carbon atoms or an aromatic ring containing 6 to 17 carbon atoms; and p is 0, 1, 2, 3, or 4.

52. (Added) The semiconductor device as set forth in claim 47, wherein the norbornene-type polymer comprises repeating units represented by Formula III below:

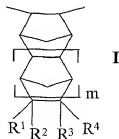


wherein  $R^9$  to  $R^{12}$  independently represent a polar substituent selected from the group:

$-(A)_n-C(O)OR''$ ,  $-(A)_n-OR''$ ,  $-(A)_n-OC(O)R''$ ,  $-(A)_n-OC(O)OR''$ ,  
 $-(A)_n-C(O)R''$ ,  $-(A)_n-OC(O)C(O)OR''$ ,  $-(A)_n-O-A'-C(O)OR''$ ,  
 $-(A)_n-OC(O)-A'-C(O)OR''$ ,  $-(A)_n-C(O)O-A'-C(O)OR''$ ,  $-(A)_n-C(O)-A'-OR''$ ,  
 $-(A)_n-C(O)O-A'-OC(O)OR''$ ,  $-(A)_n-C(O)O-A'-O-A'-C(O)OR''$ ,  
 $-(A)_n-C(O)O-A'-OC(O)C(O)OR''$ ,  $-(A)_n-C(R'')_2CH(R'')C(O)OR''$ , and  
 $-(A)_n-C(R'')_2CH_2C(O)OR''$ ; the moieties A and A' independently represent a divalent  
 bridging or spacer radical selected from divalent hydrocarbon radicals, divalent cyclic  
 hydrocarbon radicals, divalent oxygen containing radicals, and divalent cyclic ethers  
 and cyclic diethers; and n is an integer 0 or 1.

53. (Added) The semiconductor device as set forth in claim 47, wherein the norbornene-type polymer comprises copolymers comprising a combination of repeating units represented by Formulae I and II, Formulae I and III, Formulae II and III or Formulae I, II and III, where

Formula I is:

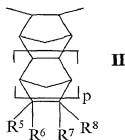


wherein  $R^1$  and  $R^4$  independently represent hydrogen or linear or branched ( $C_1$  to  $C_{20}$ ) alkyl;  $R^2$  and  $R^3$  independently represent hydrogen, linear or branched ( $C_1$  to  $C_{20}$ ) alkyl or the groups:



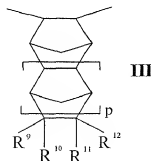
$R^9$  independently is hydrogen, methyl, or ethyl;  $R^{10}$ ,  $R^{11}$ , and  $R^{12}$  independently represent linear or branched ( $C_1$  to  $C_{20}$ ) alkyl, linear or branched ( $C_1$  to  $C_{20}$ ) alkoxy, linear or branched ( $C_1$  to  $C_{20}$ ) alkyl carbonyloxy, and substituted or unsubstituted ( $C_8$  to  $C_{20}$ ) aryloxy;  $m$  is a number from 0 to 4; and  $n$  is a number from 0 to 5; and at least one of substituents  $R^2$  and  $R^3$  is selected from the silyl group represented by the formula set forth under Ia;

Formula II is



wherein  $R^5$ ,  $R^6$ ,  $R^7$ , and  $R^8$  independently represent hydrogen, linear and branched ( $C_1$  to  $C_{20}$ ) alkyl, hydrocarbyl substituted and unsubstituted ( $C_6$  to  $C_{12}$ ) cycloalkyl, hydrocarbyl substituted and unsubstituted ( $C_6$  to  $C_{40}$ ) aryl, hydrocarbyl substituted and unsubstituted ( $C_7$  to  $C_{15}$ ) aralkyl, ( $C_3$  to  $C_{20}$ ) alkynyl, linear and branched ( $C_3$  to  $C_{20}$ ) alkenyl, or vinyl; any of  $R^5$  and  $R^6$  or  $R^7$  and  $R^8$  can be taken together to form a ( $C_1$  to  $C_{10}$ ) alkylidenyl group,  $R^5$  and  $R^6$  when taken with the two ring carbon atoms to which they are attached can represent saturated and unsaturated cyclic groups containing 4 to 12 carbon atoms or an aromatic ring containing 6 to 17 carbon atoms; and  $p$  is 0, 1, 2, 3, or 4; and

Formula III is



wherein  $R^9$  to  $R^{12}$  independently represent a polar substituent selected from the group:

$-(A)_n-C(O)OR''$ ,  $-(A)_n-OR''$ ,  $-(A)_n-OC(O)R''$ ,  $-(A)_n-OC(O)OR''$ ,  
 $-(A)_n-C(O)R''$ ,  $-(A)_n-OC(O)C(O)OR''$ ,  $-(A)_n-O-A'-C(O)OR''$ ,  
 $-(A)_n-OC(O)-A'-C(O)OR''$ ,  $-(A)_n-C(O)-O-A'-C(O)OR''$ ,  $-(A)_n-C(O)-A'-OR''$ ,  
 $-(A)_n-C(O)-O-A'-OC(O)OR''$ ,  $-(A)_n-C(O)-O-A'-O-A'-C(O)OR''$ ,

$-(A)_n-C(O)O-A'-OC(O)C(O)OR''$ ,  $-(A)_n-C(R'')_2CH(R'')(C(O)OR'')$ , and  $-(A)_n-C(R'')_2CH(C(O)OR'')_2$ ; the moieties A and A' independently represent a divalent bridging or spacer radical selected from divalent hydrocarbon radicals, divalent cyclic hydrocarbon radicals, divalent oxygen containing radicals, and divalent cyclic ethers and cyclic diethers; and n is an integer 0 or 1.

54. (Added) The semiconductor device as set forth in claim 47, wherein the repeating units containing silyl functional groups comprise at least 1 mole percent of the polymer.

55. (Added) The semiconductor device as set forth in claim 54, wherein the repeating units containing silyl functional groups comprise at least 5 mole percent of the polymer.

56. (Added) A semiconductor comprising:  
 a substrate;  
 a patterned layer of conductive material on the substrate, the patterned layer having one or more air gaps surrounded by the conductive material;  
 an overcoat layer of a material overlying the patterned layer and the one or more air gaps;  
 wherein the one or more air gaps have a height which exceeds the height of the relatively adjacent portions of the conductive material.

57. (Added) The semiconductor of claim 56, wherein the overcoat layer is a dielectric layer.--